Complete Summary

GUIDELINE TITLE

Differential diagnosis of chest pain.

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Differential diagnosis of chest pain. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2008 May 16 [Various].

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Finnish Medical Society Duodecim. Differential diagnosis of chest pain. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2004 Sep 14 [Various].

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SCOPE

DISEASE/CONDITION(S)

Chest pain (ischemic, nonischemic)

GUIDELINE CATEGORY

Diagnosis

CLINICAL SPECIALTY

Cardiology
Critical Care
Emergency Medicine
Family Practice
Internal Medicine

INTENDED USERS

Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collect, summarize, and update the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given recommendations.

TARGET POPULATION

Individuals with chest pain

INTERVENTIONS AND PRACTICES CONSIDERED

Differential Diagnosis of Chest Pain

1. Recognizing typical characteristics of myocardial ischemic pain
    - Electrocardiography (ECG) as key examination
    - Measurement of markers of myocardial injury (cardiac troponins T and I, creatine kinase [CK]-MB mass)
    - Recognizing minor ECG changes suggestive of myocardial infarction (MI)
2. Recognizing non-ischemic causes of chest pain
    - Recognizing ECG changes resembling those of an MI

MAJOR OUTCOMES CONSIDERED

Not stated

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the Database of Abstracts of Reviews of Effectiveness (DARE). In

addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Classification of the Quality of Evidence

Code	Quality of Evidence	Definition
A	**High**	Further research is very unlikely to change our confidence in the estimate of effect. • Several high-quality studies with consistent results • In special cases: one large, high-quality multi-centre trial
B	**Moderate**	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate. • One high-quality study • Several studies with some limitations
C	**Low**	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate. • One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain. • Expert opinion • No direct research evidence • One or more studies with very severe limitations

GRADE (Grading of Recommendations Assessment, Development and Evaluation) Working Group 2007 (modified by the EBM Guidelines Editorial Team).

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

Objectives

- Pain caused by myocardial ischaemia or impending infarction must be differentiated from nonischaemic chest pain. Nonischaemic pain may be caused by other severe conditions that require acute treatment, such as pericarditis, aortic dissection, and pulmonary embolism.
- Remember that patients at risk can have ischaemic chest pain in addition to nonischaemic chest pain.
- Differentiate between stable and unstable angina (see the Finnish Medical Society Duodecim guideline "Acute Coronary Syndromes: Unstable Angina Pectoris and Non-ST Segment Elevation Myocardial Infarction [NSTEMI]").

Myocardial Ischaemic Pain

- The main feature of myocardial ischaemia (impending infarction) is usually prolonged chest pain. Typical characteristics of the pain include:

    - Duration usually over 20 minutes
    - Located in the retrosternal area, possibly radiating to the arms (usually to the left arm), back, neck, or the lower jaw
    - Described as pressing or heavy or as a sensation of a tight band around the chest; breathing or changing posture does not notably influence the severity of the pain
    - Continuous with constant intensity
    - Symptoms (pain beginning in the upper abdomen, nausea) may resemble the symptoms of acute abdomen. Nausea and vomiting are sometimes the main symptoms, especially in inferoposterior wall ischaemia.
- In inferoposterior wall ischaemia, vagal reflexes may cause bradycardia and hypotension, presenting as dizziness or fainting.
- Electrocardiogram (ECG) is the key examination during the first 4 hours after pain onset, but a normal ECG does not rule out an imminent infarction.
- Markers of myocardial injury (cardiac troponins T and I, creatine kinase(CK)-MB mass) start to rise about 4 hours after pain onset. An increase of these markers is diagnostic of myocardial infarction irrespective of ECG findings (see the Finnish Medical Society Duodecim guideline "Myocardial Infarction").
- Minor signs of myocardial infarction in ECG, see Table 1 in the original guideline document.

Nonischaemic Causes of Chest Pain

- For nonischaemic causes of chest pain, see Table below entitled "Nonischaemic Causes of Chest Pain".
- For ECG changes resembling those of a myocardial infarction (MI), see Table below entitled "ECG Changes Resembling Those of an MI")

Table. Nonischaemic Causes of Chest Pain

Illness/Condition	Differentiating Symptoms and Signs
Reflux oesophagitis, oesophageal spasm	• No ECG changes • Heartburn • Worse in recumbent position, and also whilst straining, like angina pectoris • The most common cause of chest pain. Be careful to recognize a risk patient who also has ischaemia.
Pulmonary embolism	• Tachypnoea, hypoxaemia, hypocarbia • No pulmonary congestion on chest x-ray, which is often normal • Clinical presentation may resemble hyperventilation. • Arterial oxygen pressure (PaO_2) decreased or normal, partial arterial pressure of carbon dioxide ($PaCO_2$) decreased • Pain is not often marked. • D-dimer assay positive; negative result excludes

Illness/Condition	Differentiating Symptoms and Signs
	pulmonary embolism
Hyperventilation	Hyperventilation Syndrome • The main symptom is dyspnoea, as in pulmonary embolism. • Often a young patient • Tingling and numbness of the limbs, dizziness • $PaCO_2$ decreased, PaO_2 increased or normal Secondary Hyperventilation • Attributable to an organic illness/cause; acidosis, pulmonary embolism, pneumothorax, asthma
Spontaneous pneumothorax	• Dyspnoea is the main symptom in the initial phase, later dyspnoea on exertion only. • Auscultation and chest x-ray
Aortic dissection	• Severe pain with changing localization • Type A dissection sometimes obstructs the origin of a coronary artery (usually the right) with signs of impending inferoposterior infarction • Pulses may be asymmetrical • Sometimes broad mediastinum on chest x-ray • New aortic valve regurgitation
Pericarditis	• Change of posture and breathing influence the pain. • A friction sound may be heard. • ST-elevation but no reciprocal ST depression
Pleuritis	• A stabbing pain when breathing. The most common cause of stabbing chest pain is, however, prolonged cough
Costochondral pain	• Palpation tenderness, movements of chest influence the pain • Might also be an insignificant incidental finding
Early herpes zoster	• No ECG changes, rash • Rash appears after a couple of days

Illness/Condition	Differentiating Symptoms and Signs
	• Localized paraesthesia before rash
Ectopic beats	• Transient, in the area of the apex, felt also at rest
Peptic ulcer, cholecystitis, pancreatitis	• Clinical examination (inferior wall ischaemia may resemble acute abdomen). Be careful to recognize a risk patient who also has coronary heart disease.
Depression	• Continuous feeling of heaviness in the chest, no correlation to exercise • ECG normal
Alcohol-related	• A young or middle-aged male patient in a casualty department in a drunken condition. Remember the possibility of ischaemia.

Table. ECG Changes Resembling Those of an MI

ST Changes Resembling Those of Acute Ischaemia

ST segment elevation	Early repolarization in V1–V3. Seen particularly in athletic men ("athlete's heart") Acute myopericarditis in all leads except V1, aVR. Not resolved with a beta-blocker. Pulmonary embolism – in inferior leads Hyperkalaemia Hypertrophic cardiomyopathy
ST segment depression	Sympathicotonia Hyperventilation Pulmonary embolism Hypokalaemia Digoxin Antiarrhythmics Psychiatric medication Hypertrophic cardiomyopathy Reciprocal ST depression of an inferior infarction in leads V2–V3–V4 Circulatory shock
QRS changes resembling those of Q wave infarction	Hypertrophic cardiomyopathy Wolff-Parkinson-White (WPW) syndrome

	Myocarditis Blunt cardiac injury Massive pulmonary embolism (QS in leads V1–V3) Pneumothorax Cardiac amyloidosis Cardiac tumours Progressing muscular dystrophy Friedreich's ataxia
ST changes resembling those of a non-Q wave infarction	Increased intracranial pressure–subarachnoid bleed – skull injury Hyperventilation syndrome Post-tachyarrhythmia state Circulatory shock – haemorrhage – sepsis Acute pancreatitis Myopericarditis

Related Resources

Refer to the original guideline document for related evidence, including Cochrane reviews and other evidence summaries.

Definitions:

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Code	Quality of Evidence	Definition
		• One or more studies with severe limitations
D	**Very Low**	Any estimate of effect is very uncertain. • Expert opinion • No direct research evidence • One or more studies with very severe limitations

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CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Appropriate differential diagnosis of chest pain

POTENTIAL HARMS

Not stated

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Staying Healthy

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

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ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 May 4 (revised 2008 May 16)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Author: Editors

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

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GUIDELINE AVAILABILITY

This guideline is included in "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on August 28, 2001. The information was verified by the guideline developer as of October 26, 2001. This summary was updated by ECRI on April 2, 2004, October 1, 2004, and most recently on February 21, 2005. This summary was updated by ECRI Institute on September 30, 2008.

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